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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/085,614

02/28/2002

William R. Rehman

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8104

27483

7590

05/05/2004

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EXAMINER

KOCH, GEORGE R

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,614

Applicant(s)

REHMAN ET AL.

Examiner

George R. Koch III

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2004.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31 and 33-39 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 31 and 33-39 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/23/2005

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/22/2004 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 38-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. It is unclear how, in claim 38, that the said negative tribocharging augments said negative tribocharging. In claim 31, there is only a single tribocharging material component. It appears that applicant intended to recite that the negative tribocharging augments the *corona* charging. This is supported by the fact that the claim further recites that the tribocharging allows for a reduced corona charging voltage.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 31, 33, 37, 38 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Vohringer (US Patent 4,798,340).

Vohringer discloses a powder coating material spray gun having an electrode (item 13) to charge powder coating material to a negative electrical polarity and including a component (items 11, 21, and 22 - see column 3, lines 48-57) which is contacted by powder flowing through the spray gun, wherein the component is constructed from a tribocharging material which tribocharges the powder coating material to the negative electrical polarity (see column 5, line 67 to column 6, line 3, which discloses that the powder is both subjected to negative tribo-electric charging and a negative corona voltage during spraying). The apparatus is capable of functioning as claimed, by giving up electrons to the powder.

As to claim 33 and 37, Vohringer discloses that the interior pipe (item 11) extends through to the spray nozzle exit (see column 3, lines 1-9, which indicates that the electrodes at the nozzle are "extended radially into the delivery channel defined by the inner surface 11" and Figure 1 which shows that inner surface 11 extends to the spray exit). Therefore, Vohringer discloses that the component can be the spray nozzle.

As to claim 37, Vohringer discloses that the interior of the spray gun is made of tribo-charging material (see column 4, lines 63-68). This would include the powder feed tube (item 11), the pump (item 37) and powder hose (item 34), as well as elements

within the tube which are components having a surface that is contacted by powder during a spraying operation of the gun (such as displacement body).

As to claim 38, Vohringer discloses that the corona charge "boosts" the charge implemented by the tribocharging (see column 3, line 48 to column 4, line 24). Therefore, the tribocharging and corona charging both add to the charging effect, and thus the voltage needed is reduced for a similar effect. Therefore, the negative tribocharging in Vohringer augments the corona charging to allow a reduced voltage for the corona charging compared with the voltage needed in the absence of the augmenting tribocharging.

As to claim 39, the apparatus of Vohringer is capable of reducing back ionization and Faraday cage effects (see column 4, lines 2-6 for a discussion of Faraday effects).

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
8. Claim 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vohringer, as applied to claim 31 above, and further in view of any of (1) Lader, (2) (a) Handbook of Plastic Compounds, Elastomers and Resins with (b) Powder Coating : The complete finisher's handbook 1st Edition (3) Conductive Polymers and Plastics or (4)

Mammino (US 5,683,844) or (5) Peck (4,090,666) and the Delrin AF fact sheet from Interstate Plastics (published in 1999) or (6) Walberg (US 3,896,994).

Vohringer is silent as to many of the materials used.

Lader does not disclose that any of the claimed materials can form the tribocharging surface. However, Lader does disclose that materials used as powders can be reversed to be used as charging surfaces, and vice versa (see column 1, lines 56-64). Therefore, Lader discloses that it is known to reverse materials for triboelectric operations - i.e., use powders as contact surface and vice versa.

As to the aminoplastic resin, Handbook of Plastic Compounds, Elastomers and Resins discloses that it is known to use aminoplastic resins as a coating material for automobile primer and enamel applications (for example, any of the Uformite ® entries on page 65). Automobile painting is conventionally performed by an electrostatic coating process (for example, see page 1 of Powder Coating, which discloses that electrostatic powder spray is the most common form of spraying in industrial applications). Under the reversibility principle disclosed in Lader, these aminoplastic resins can also be used as charging surfaces. Such a charging surface would allow for the application of different powders and would improve coating versatility in an industrial environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized an aminoplastic as the charging surface.

As to the polyamide or polyamide resin blends, Conductive Polymers and Plastics (in pages 181-187) discloses polyamide resin blends such as polyphenylene ether and polyamide as a coating material for electrostatic coating. Under the

reversibility principle disclosed in Lader, these polyamide resin blends can also be used as charging surfaces. Such a charging surface would allow for the application of different powders and would improve coating versatility in an industrial environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a polyamide resin blend as the charging surface.

As to the polyamide or fiber reinforced polyamide, Mammino discloses fiber reinforced polyamide such as fibrillated PTFE (see columns 5 through 7 and polyamide as a coating material for electrostatic coating applications. Under the reversibility principle disclosed in Lader, these fiber reinforced polyamides can also be used as charging surfaces. Such a charging surface would allow for the application of different powders and would improve coating versatility in an industrial environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a fiber reinforced polyamides as the charging surface.

As to the polyamide or acetal polymer, Peck discloses that it is known to use delrin (an acetal polymer), nylon (a polyamide) and Teflon in the fluid flow due to their excellent transfer efficiencies. Further, the specifications for delrin AF (a mixture), published in 1999, disclose that delrin AF, an acetal bulk resin with 20% PTFE (see applicants specification, page 12) has similar dielectric properties to ordinary delrin. Ordinary delrin has a dielectric constant of 3.7 and a dielectric strength of 380 Volts/mil, and delrin AF has a dielectric constant of 3.1 and a dielectric strength of 400 Volts/mil. Since triboelectric charging effectiveness is a factor of dielectric properties, one in the art would appreciate that delrin AF is an acceptable substitute of the delrin surface cited

in Peck. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized an acetal polymer combined with polytetrafluoroethylene fibers such as Delrin AF as part of the charging surface in Lader since Peck discloses using delrin and delrin AF is equivalent to delrin, and such a substitution could lead to improved transfer properties.

As to another version of an acetal polymer, Walberg discloses that the internal mix cap, a part of the fluid flow, is manufactured from Celcon, cited by applicant as an acetal copolymer. Such a charging surface would allow for the application of different powders and would improve coating versatility in an industrial environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized an acetal copolymer as part of the charging surface.

As to claims 34, official notice is taken that is considered well known and conventional to mix the above disclosed materials to form a tribocharging surface, in order to modulate the charging strength of the surface and powder, in order to achieve different charging effects.

As to claim 35-36, Peck as applied to claim 34 above discloses using Delrin materials in electrostatic operations, and Delrin AF is an acetal resin bulk material with PTFE therein, specifically Delrin AF is has 20% PTFE.


Response to Arguments

9. Applicant's arguments with respect to claims 31 and 34 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-800-877-8339 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


George R. Koch III
Patent Examiner
Art Unit 1734

GRK
May 2, 2004